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No. 2569.—VOL. LIV.

LONDON, SATURDAY, NOVEMBER 15, 1884.

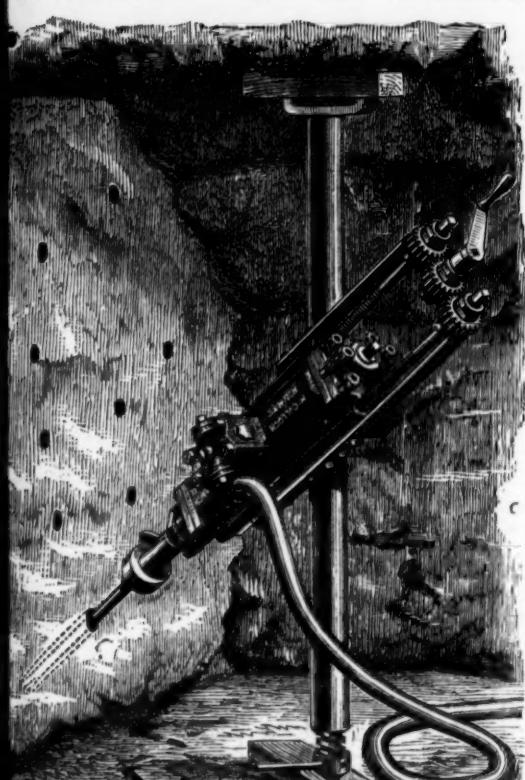
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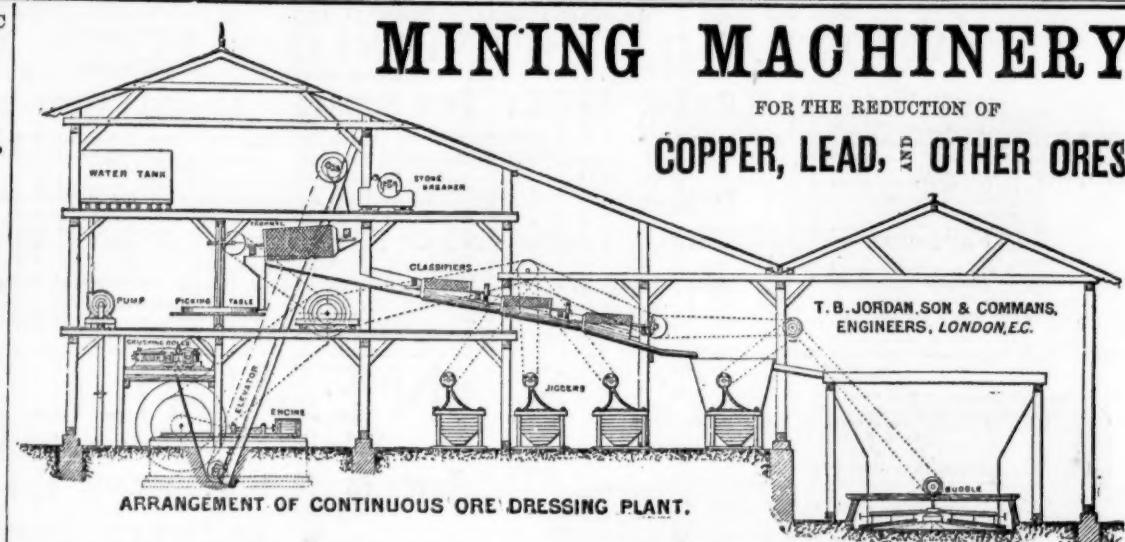
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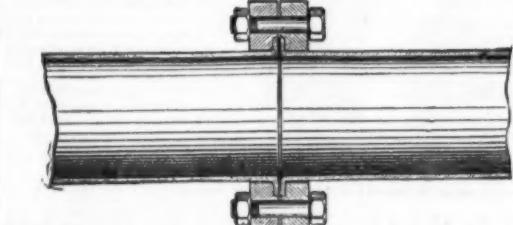
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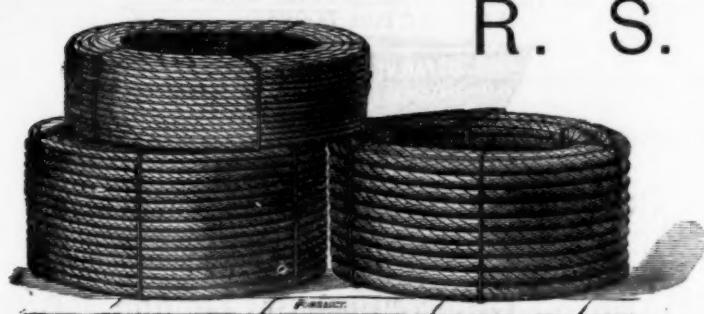
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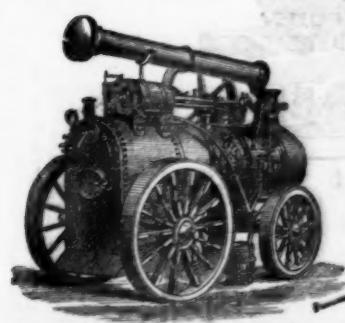
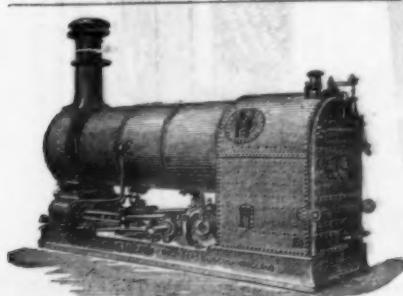
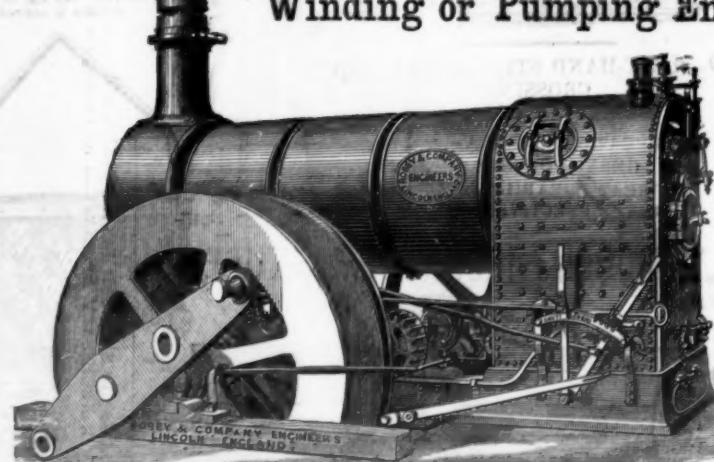
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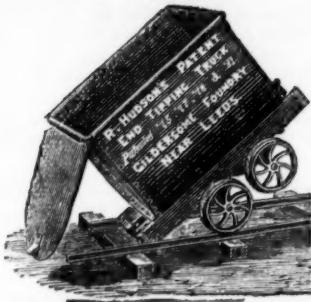
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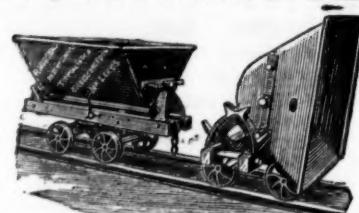
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TIP WAGONS.



7.—PATENT STEEL MINING WAGONS.



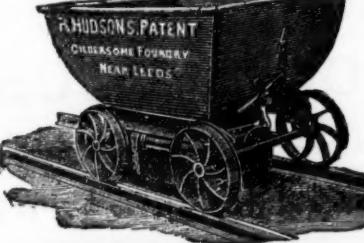
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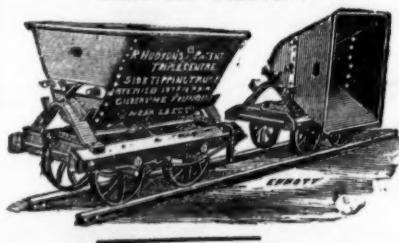
8.—PATENT DOUBLE-CENTRE STEEL
SIDE TIP WAGONS,
Will tip either side of Wagons.



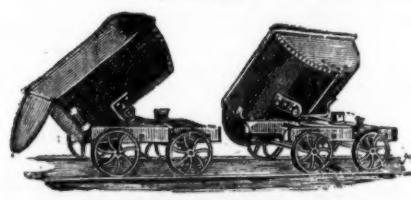
12.—PATENT STEEL HOPPER WAGON,
WITH BOTTOM DOORS.



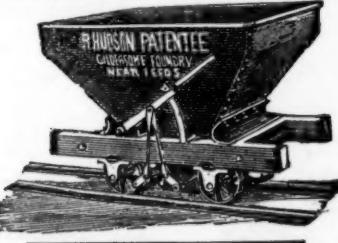
3.—PATENT TRIPLE-CENTRE STEEL
SIDE TIP WAGONS.



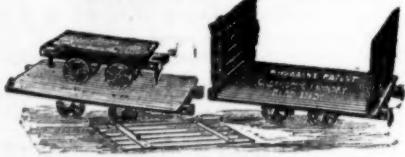
9.—PATENT STEEL ALL-ROUND TIP
WAGON.



13.—PATENT STEEL HOPPER WAGON.



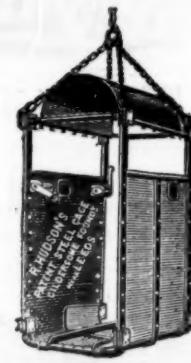
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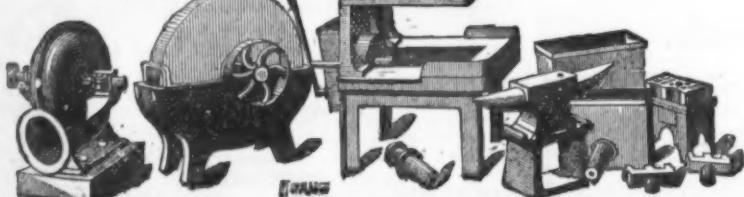
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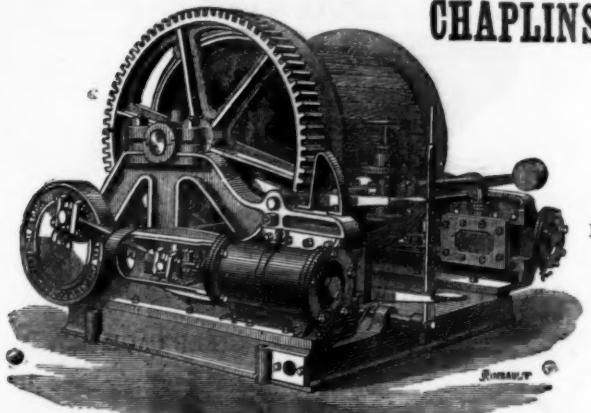
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Original Correspondence.

GOLD AND SILVER MINES OF COLORADO.

MINERAL WEALTH OF OURAY—OPPORTUNITIES FOR INVESTMENT.

SIR.—The following interesting description of the mineral wealth of Ouray, from the pen of an experienced miner, appeared in a recent number of the Chicago Mining Review, and will doubtless be read with interest by many of your readers who have become associated with the various English companies doing business in that locality. In times past I have frequently seen articles published in regard to the valuable ores this district contains. I was under the impression it must have been exaggerated. I came here in May, 1879, and during the time I have been here I have had ample opportunity to examine every mine in this vicinity and their ores, and make a thorough examination of them; therefore, I feel confident in saying this locality does not require the least exaggeration whatever. Here the mountains for 20 miles square are interlaid with great fissure veins that run in all directions, the outcrop of ore along the surface is wonderful. In all my travels and observations, never did I observe such a display of ore on the surface. Nature has truly made these mines the wonder of the 19th century.

The veins here are all true fissures, and all practical men are fully aware of the permanency of this class of veins, and their character as regular and constant producers. The ore is ruby and brittle silver, and fine grain galena grey or yellow copper, of a high per cent. The grey is quite rich in silver, while the yellow is rich in gold. The ores are in no way refractory, but easily treated. All the mines in this district have paid their way from the grass roots down, and increased in value as depth was obtained.

The greatest proportion of the mines here belong to men of limited means, who have not sufficient capital to work them properly, therefore, they are worked in a desultory manner by the original discoverers, by extracting the high grade ores, and leaving all that would not exceed \$50 in silver to the ton, as it would not pay to ship to the reduction works for treatment. Had they been in the hands of capitalists they would be worked at enormous profit. A serious injury to this section of country in every branch of business has been caused by the Ute Indians and inconvenience of roads, both wagon and railroads. I am happy to say those difficulties are now about satisfactorily removed. The Indians are removed to Utah. The Denver and Rio Grande Railroad is open to within about 32 miles of Ouray, and there is every probability of it in a short time being extended to this town. Two new wagon roads are just completed, leading from Ouray, one to Red Mountain, 8 miles, and one to Mount Sneffels 7 miles, the leading camps of the district. The ore in future will be taken in wagons, instead of being packed on animals, making considerable difference in cost.

About $\frac{1}{2}$ mile south of Ouray is the mineral farm property, which was taken up as four regular parallel claims, 1500 by 300 ft. each, and, therefore, comprise about 40 acres of ground. Some contend that there are four parallel fissure veins. My opinion is that it is a deposit of ore on a limestone bed, similar to those in the Banat, Hungary, and that they extend more or less over the greater part of the 40 acres. At any rate, there has been enough ore exposed and deep enough already to make it practically inexhaustible. What has been taken out so far has been simply quarried from the surface, and there seems to be literally acres of it. The ore is of different kinds. One is a bright, fine galena, running about 120 ozs. silver to the ton and 50 per cent. lead. Another is a highly argentiferous grey copper in a gangue of baryta. This ore has milled from 400 to 700 ozs. of silver to the ton.

Among the foremost in amount of work done is the Union Mine, about 2 miles from Ouray. The altitude of the Union is 9500 ft. above sea level, has trachyte for its walls; the lode averages about 5 ft. in width, and trends north-west and south-east. The pay-streak varies from 12 to 30 in. The character of the ore is brittle, ruby and native silver, associated with fine galena: 75 tons of ore have been sold that averaged 227 ozs. of silver and 1 oz. of gold to the ton. About 200 tons of shipping ore are now on the dump, awaiting the nearer approach of the railroad and cheaper freights. The Silver has a remarkable record for a prospect. About 13 tons of ore has been sold from it, having been taken out of a shaft 90 ft. deep, which averages about 209 ozs. per ton. The ore is principally iron and copper pyrites and brittle silver, associated with galena. The ores are easily separated.

The Silver Point is a valuable property, lode about 5 ft. between walls, in quartzite formations, and is working at an altitude of about 10,000 ft., but is well situated for economical extraction of its ores, being in good pine timber, and a depth can be gained on the vein of upwards of 1000 ft. by drifting alone. The character of the ore is galena and copper and iron pyrites, the average width of the ore being 30 in. The average yield of the ore is from 158 to 218 ozs. in silver per ton.

Among the prominent groups of mines on Bear Creek, in the Uncompahgre district, is the Flagstaff group, consisting of five full claims. The character of the ore is grey copper and galena, and the main vein is fully 12 ft. between walls. Mill runs of the ore have yielded as high as 209 ozs. per ton, and 25 per cent. of copper. At a distance of about 7 miles south of Ouray you come to Mount Sneffels basin; this is the terminus of the new wagon road just completed. This basin is traversed by a great number of well-defined lodes, that may be seen on the surface of the ridge dividing it from Marshall basin. Many of these lodes are opened to a considerable extent, although they belong to men of limited means, who have not sufficient capital to work them systematically; they have paid their own way from the grass roots down, although developed in a very desultory manner. From the great uniformity of these lodes I regard the whole group as a system of fissures formed contemporaneously, and from the great similarity of the character of the ore I think the ores and the vein matter they contain had a common origin. The ores have white crystalline quartz as the matrix of the metals, and with galena as their base, including highly argentiferous grey copper, silver glance, native silver in leaf and wire, peacock copper, and the blue and green carbonates of copper.

On the west side of Sneffels basin, and in close proximity, is the well-known Yankee Boy group of mines, comprising the Yankee Boy, Dutch Boy, York State, and Genesee. The Yankee Boy and Dutch Boy are adjoining claims on the same vein, and this is another of those extremely rare claims which has paid from the grass roots, but has been worked in a desultory manner by lessees and by the original discoverers, who are still owners. This is undoubtedly true fissure vein, from 4 to 6 ft. between the walls in trachyte formation, character of the ore, ruby and brittle silver, and fine steel grain galena. In 1877 the owners sold 21 tons of ore that gave average mill returns of 350 ozs. silver to the ton; in 1878 nearly 200 tons were produced, and one lot of 23 tons averaged, it is said, 1231 ozs. silver to the ton. I find it hard to obtain very exact statistics, as a great deal of ore was extracted and sold by lessees and no account kept, but as nearly as I can estimate there are some 600 ft. of levels or drifts on the vein, and ore to the value of over \$100,000 has been sold.

Joining the Yankee Boy is the Eldorado Mine, which is considered one of the prettiest lodes in Sneffels district, but owing to its still being in the hands of the original discoverers, who are men of limited means, but little work has been done. What has been done, however, is all dead work, the ore taken out in driving on the vein has more than paid for all the work. This mine is situated close to the end of the toll road leading to Ouray. The lode outcrops up the mountain side, and has sites on it for at least five levels or drifts on the course of the vein. The character of the ore is ruby and brittle silver, with a high per cent. of grey copper. From various mill runs the highest gave a yield of 1400 ozs. silver per ton, and 4 ozs. in gold, when the lowest were 138 ozs. silver and \$11 in gold per ton. There remains on the dump about 75 tons of ore carrying from 50 to 100 ozs. silver to the ton, that would not in the past pay to ship, but owing to the reduced cost of smelting and transportation charges, that class of mineral now pays very handsomely. On the south side of this basin is another large group of mines located too numerous to make mention of.

The character of the ore is ruby and brittle silver, with a high per cent. of grey copper. Some of these lodes contain free gold, but not to any great extent.

I am not aware of anyone being at work on any of these claims mentioned. They await cheaper freights, capitalists, or suitable reduction works. Very valuable mines could be had at this time upon very advantageous terms, in which, when put in proper working order under practical and judicious management, the profits would be enormous, the regular monthly dividends would only depend upon the number of hands employed. Let any geologist or mineralogist make a thorough examination of this whole section of country, I feel confident that he will substantiate what I say. The information I give is not theoretical, but practical, having had over 30 years' experience in practical mining, a part in England, where I had entire charge of large and extensive mines, and 17 years of the later part in California, Nevada, Utah, and Colorado. This should, in my opinion, enable me to be fully aware of what I am writing. My extensive knowledge leads me to safely say that this section of country presents to capitalists opportunities not to be found elsewhere, when the richness of the ores, the facilities for mining and treating the ore, and the future prospect of the incoming railroad for handling the products, are taken into consideration.

Denver, Oct. 28.

OCCASIONAL.

MINING IN SOUTH AUSTRALIA.

SIR.—The last report of the Moonta Mine proprietors will have reached you before this; and although the profits realised have been but small compared with those of former days, it is satisfactory to know that in the present low state of the copper market any profit at all has been made, and that the mine still finds employment for so many hands. It has long been my opinion that as in agriculture we have confined our attention too much to the growth of wheat, so in mining we have gone in for copper to the exclusion of other minerals which are to be found here, though their existence is known to comparatively few. Since my recent visit to the silver mining district on the Barrier Ranges, just over our north-east border, in the adjoining colony of New South Wales, I have noticed that similar country in its geological features is to be found in our own colony. Time has not allowed of my visiting any of the localities giving indications of silver deposits; but my letters and those of others to the local papers have stimulated the search, and two or three payable finds of silver are already reported. As soon as I can arrange for a trip into the interior I intend going prospecting for silver, or anything else better than copper or lead.

Our gold mines have made a decided improvement. The Alma and Victoria are turning out about 17 dwt. to the ton, and the Bird-in-Hand 10 or a little over. Some new and very promising gold discoveries in old mining districts such as Barossa, Echunga, and Woodside, are showing such good results that it is hoped we may shortly see a revival of gold mining here. All that is wanted to develop our gold mines is capital, labour, patience on the part of the shareholders, and, if it could be attained, non-interference of brokers with the shares. Many honest investors in mining here have become so disgusted with the way in which their investments have been upset by the "men at the corner" that they cannot now be induced to speculate in mining upon any consideration. If our mines are worked by foreign capital the brokers are not able to meddle with the shares, as they do in purely local companies. It is true they cut their own throats by their eagerness to make money out of shareholders as quickly as possible, and if the process could be accomplished literally, so as to put them for ever out of the way, there would be some hope for the success of mining; but they are hydra-headed, and irrepressible. Several good mining properties are held in abeyance waiting a favourable chance of development. I think I have in a former letter mentioned a rich vein of antimonial nickel which is found in one of our northern districts. Terms might be made with the proprietors for working the property. I hope it will not be long before I am able to send you a better letter than this.

J. B. AUSTIN.

SILVER MINING IN NEW SOUTH WALES.

SIR.—The subjoined extract from the Sydney Daily Telegraph gives a little additional information as to the working, and practical results from it, of the Sunny Corner Silver Mine to that of my previous letter on this special subject. The writer states that at the Sunny Corner Mine, Mitchell's Creek, the first run of the Pacific smelter has been most satisfactory. The furnace was run for a period of 14 days from the time of lighting up. Altogether 248 tons, including about 50 tons of tailings, were put through. The return was equal to about 1000 ozs. per day, or about 14,000 ozs. of silver. The bullion which contains this silver will be treated as soon as the refinery is finished. As near as can be ascertained the average of the ore and tailings has been about 50 ozs. of silver to the ton. Even with this ore the return of the 14 days has been more than sufficient to pay for the furnace and the cost of its erection. When the better class ore, some of which is equal to 400 ozs. to the ton, is treated the returns will be even more satisfactory. To-day the furnace will be started on a trial parcel of about 20 tons from the Silver King Mine. This ore is said to be about 80 oz. ore. The owners of the Silver King Mine having entered into negotiations for the purchase of a smelter, are naturally desirous of seeing their ore run, and the Sunny Corner Company have obligingly allowed them the use of their furnace. The successful treatment of tailings, as demonstrated during the late 14 days' run of the Pacific smelter, is one of the greatest importance to the field. The company has many thousands of tons of these tailings, which contain about 40 ozs. of silver to the ton, and it is only by smelting that they can be made to yield up their treasure. At Tonkin's Mine the lode has been intersected in the tunnel, and about 50 tons brought to paddock. The manager has proved the lode to contain highly payable silver, and he purposes to treat a quantity of the ore at Brown's battery shortly. In Ross and Gray's 40-acre lease, between the Sunny Corner and the Hidden Treasure, a large silver-bearing lode has been opened out. The ore is very similar in appearance to that of the Sunny Corner, and the lode is doubtless a continuation of the latter. The shaft is down about 90 ft. on the ore, and it is improving in appearance as the deep ground is reached. The surface indications on this valuable block are highly encouraging; as many as four distinct mineral lodes crop out within the lease. Several samples from this mine have been sent to the School of Arts, Sydney, for assay, so that the actual value of the ore may be known. The existence of the precious metals has already been ascertained by rude processes. New buildings are still rapidly going up in the new Silver City, and ere many weeks several large hotels will be fit for occupation. A regular coach has been put on from Bathurst, and one is about to be started from Rydal. At present the mailman, Mr. Baker, runs a buggy every day from Rydal at the low fare of 6s. each way. There are, of course, all sorts of rumours about the quantity of ore at grass and in sight, and the value of it, more than one "quidnunc" putting it as worth at least 1,000,000\$, whilst even more cautious visitors to the mines put it at some hundreds of thousands sterling.

There has been some excitement recently in connection with the celebration of the 29th anniversary of the opening of the first railway in Australia. On Sept. 26, 1855, the railway line from Sydney to Parramatta was opened for traffic, and since that time railway construction has proceeded until there are now over 1600 miles of railways in use, about 300 in course of construction, and proposed extensions representing over 1400 miles under the consideration of Parliament. The total capital expenditure on railways opened and in course of construction at the end of last year was 19,188,464\$, of which there was expended in 1883, 2,411,822\$. The gross earnings from all sources last year were 1,931,464\$, being an increase over the amount for 1882 of 232,602\$, a sum which would have been 100,000\$, more but for a reduction which was made in railway rates. The working expenditure amounted to 1,177,788\$. The mileage run was 1,086,134 miles in excess of the number for 1882. If the rates for 1883 had been maintained at what they were in 1882 the revenue from the railways would have been 2,079,278\$, and but for an increase of wages the expenditure would have been 34,000\$ less. There were added to the rolling stock during the year 28 locomotives, and 275 passenger and 797 goods vehicles. In the number of trains run there was an increase of 11.65 per cent.; in the number of miles travelled

by trains an increase of 22.39 per cent.; in the number of passengers carried an increase of 14.33 per cent.; in the earnings from coaching traffic an increase of 12.58 per cent.; in the number of live stock carried by trains an increase of 28.95 per cent., a result largely attributable to moving stock to feeding grounds; in the carriage of minerals an increase of 7.02 per cent.; in the carriage of wool an increase of 125,088 bales, or 53.02 per cent.; in the carriage of general merchandise an increase of 91,637 tons, or 12.63 per cent.; and in the earnings from goods traffic there was an increase of 158,675\$, or 14.28 per cent. Within the last two years this colony has been particularly busy in the matter of railway extension, and the railway openings have been numerous. About two years ago the opening to Hay in the south-west took place, and that was followed by the opening of the line to Boggabri in the north-west. Then came the opening of the line to Uralla in the north, and after that the opening of the extensions to Narrabri in the north-west, Nevertire in the west, Armidale in the north, and Nyngan also in the west. Following upon these there was the junction of the New South Wales and Victorian railways at Albury, and then the opening of the railway extensions to Tarago in the south, Glen Innes in the north, Mudgee in the west, Byeroak also in the west, and Jerilderie in the south. It is expected that in a little more than two years the railway system of this colony will be joined to that of Queensland, and that within the same period the connecting link between the Great Southern and Great Northern railways will be completed. There will then be uninterrupted railway communication between the three capitals of Queensland, New South Wales, and Victoria; and as Victoria and South Australia are arranging to connect their railway systems, the four principal colonies will very soon be joined together, if not by a political and social federation, at least by those iron bands which largely promote trade, and in many other ways materially assist Australian progress.

There has been a discovery in a fresh district of rubies, garnets, and emeralds, and at the new Mittagong diamond washings an extremely fine sapphire was got last week, and some fair sized gems of different sorts, notably two nice diamonds of good water, &c.

Sydney, October.

R. D. A.

THE SILVER-BEARING LODES OF THE BARRIER RANGES

No. I.

SIR.—I subjoin a further portion of the Geological Surveyor's report on the Silverton Mines, which will doubtless be useful to readers of the *Mining Journal*, seeing that the district presents the best possible field for the profitable employment of British capital. America, with its usual promptitude, dispatched the representatives of a wealthy syndicate to the scene of action, not merely to prospect, but also to buy claims. The Apollyon, the Hen and Chicken, Mieche's Blow, the Pluckup, the Lubra, and other extensive mines, which are yielding good results, are direct evidence that the Barrier Ranges mines are rich in silver, and present a good and genuine field for legitimate investment.

The Ministry have at last moved in the matter of water conservation for Silverton, also in their railway policy have arranged for a light railway from Forbes to Wilcannia. Mr. Michael Schostak, an eminent Russian engineer, who had charge of the Czar's private mines in Siberia, arrived in Sandhurst, Victoria, in the beginning of September. The object of his visit to the Colonies is to gain the benefit of the practical experience with regard to the various departments of work attending the gold mining industry.

Sunny Corner, Mitchell's Creek, have commenced smelting in the beginning of this month (September). The smelter is one supplied through their agent in Sydney, the first in New South Wales, by the Pacific Ironworks Company, in San Francisco. The success of the smelter creates a new industry in the colony. Two years ago these mines in Mitchell's Creek, could hardly be sold for 2000\$. to-day they are cheap at 1,000,000\$ sterling. Messrs. Tonkin and Johnston's Claim has just struck the grand lode, over 10 ft., in the finest ore possible, and not yet through. The excitement in Mitchell's Creek is intense. Another large furnace is in course of erection, and is expected to be finished in two months' time, and will treble the output of bullion.

Emmaville.—Another new silver lode has been discovered 3 miles from the previous find; 200 acres have already been applied for.

Otto Electric Gold Saver.—A patent for this has just been secured in Victoria. But the patent was applied for, and trials of the apparatus had been made at Maldon and Fryerstown. Mr. Rowe, of the latter place, put it to the severest test, and would have been satisfied if it had only saved the colour of gold, as he was crushing quartz yielding only 3 dwt. of gold to the ton, crushed quartz passing over the usual copper plates and ruffles charged with mercury before passing through Mr. Otto's gold saver. The result was the saving from 15 to 17 grs. of gold out of less than three-quarters of a ton of this poor quartz. It is claimed for Mr. Otto's invention that it makes the mercury practically a gold magnet, the electricity being applied in the opposite way to that described by Mr. Barker's method, the electric current through the positive pole being in direct contact with the mercury by a platina point at the bottom of the mercury tray, connected by a wire conductor to the electric generator or dynamo, the negative pole being above the mercury the wire conductors connected with the carbon slabs and also with the electric generator. As soon as the water flows from the battery, or Chilian mill, through the mercury tray, and beneath the carbon slabs the circuit is complete, and not till then. The effect is that the mercury is galvanised, and becomes at it were a gold magnet, and the water repels or rejects the gold, however fine, and as it flows away leaves the gold behind it in the mercury, which always remains bright, and no matter how charged with gold continues to exercise its galvanic power or action on all gold that is contained in the water or crushed quartz that comes from the mill.

The concluding portion of Mr. Wilkinson's report on the silver-bearing lodes in the Barrier Ranges has already been given; in the preceding part of the report, in which he furnishes the details of the various lodes examined by him, he states that Silverton, which is the commercial head-quarters of the silver mining portion of this district, is situated 13½ miles from the boundary line of New South Wales and South Australia, or about 590 miles in a straight line W.N.W. from Sydney, and 257 N.E. from Adelaide. It occupies a convenient position upon the main road from Adelaide to Wilcannia, and is near the western margin of a large tract of broken hilly country, generally known as the Barrier Ranges, which, almost surrounded by open saltbush plains, extend for 150 miles in a N.E. direction, varying in width up to 110 miles; there are also several saltbush plains here and there between some of the ranges.

Nearly the whole of the country consists of metalliferous formations, but it is chiefly on the south-western portion that the silver and lead lodes have yet been discovered.

The geological formations consist of metamorphosed clay-slates and talcose mica schists, with intrusive masses and dykes of granite and diorite, which traverse the sedimentary rocks generally in a north-easterly direction, but sometimes in all directions, forming almost a network of dykes. In places the schists pass into gneiss, which imperceptibly changes into porphyritic granite.

The silver-bearing lodes occur chiefly in the mica schists in the vicinity of the granite dykes. It would seem as though the contraction of the rocks upon cooling after the intrusion of the igneous rocks resulted in the formation of irregular fissures, which became filled with the metallic sulphides and other minerals composing the lodes.

By the enormous denudation which these formations have undergone valleys have been eroded, leaving intervening rough rocky ranges from 100 ft. to 500 ft. high, and exposing lodes at all levels. Thus we are enabled to see portions of lodes above which hundreds of feet of rock have been removed, and as at the different levels they exhibit similar characteristics as regards irregular thickness and length this mode of occurrence will doubtless be found to continue as they are followed below the present surface of the ground.

The lode stuff consists chiefly of porous brown oxide of iron, or gossan, and occasionally quartz containing carbonates of lead and copper, galena, and chlorides of silver. The latter are of a light or dark green colour, and occur in veins and thin scales, or in grains irregularly disseminated through the ore. The miners readily recog-

cartridge than by saying that ample evidence has been obtained from experiments in the North of England, Yorkshire, and South Wales that shot-firing can be carried on not only with safety but with actual profit by the use of this cartridge. I can myself bear testimony to the surprise and satisfaction expressed by the colliers in a South Wales colliery on witnessing operations carried on with the cartridge.

Its merits were some little time back placed before one of the members of the Accidents in Mines Commission, and are now being brought prominently under the notice of the Home Secretary and the Colliery Deputation, so that we may venture to hope that after an exhaustive and impartial trial has been made of the system of blasting by hydraulic or water cartridges in combination with the recent important discovery of the liquid cartridge, which is also safe and economical in explosives, there will be no need for the enforcement of the rule now so strongly objected to respecting shot-firing in coal pits.

JOHN DAY,

See Safety Hydraulic Cartridge Syndicate.

Gracechurch-street, Nov. 13.

HE GUAYANA COMPANY, AND THE CHILE GOLD COMPANY.

"ARCADES AMBO."

SIR.—You are no doubt aware that the shareholders of the Chile Gold Company, after certain "surprising disclosures" made at a general meeting last month, have appointed a committee with a view of "putting their house in order." This committee have now called a meeting. Will the committee then lay before the shareholders satisfactory explanations of the past management of the company's business and interests in Venezuela? I am afraid the task is more difficult than some people seem to consider it to be. It seems probable that the committee will come forward with some plan for going into voluntary liquidation and subsequent reconstruction with a reduced capital. The course followed by the Potosi Gold Company will no doubt be offered and recommended as an example which the shareholders of the Chile Gold should follow. Before, however, they come to any decision and accept the proposed plans, the Chile shareholders would perhaps do well and wisely to first of all ascertain that their mines are truly and really in the same conditions and possess the same real elements of eventual success as were found in the Potosi Company's property when the latter was reconstructed. The Chile shareholders ought to ascertain whether it is true or not that the only, or anyhow the principal source whence the yield of gold has been drawn on their mine, since the company was formed, was the "Austin No. IX. Concession," and, if so, they must well bear in mind that this concession is no longer held by the Chile Gold Company, or by anyone attached to it or acting for it. The future of the company must be entirely dependent on the company's own original property, setting aside honestly and once for all all ideas of appropriating, by way of remedies, the properties of neighbours by any such means or processes as at the Chile Company, or its agents, have been justly or unjustly accused of employing. This is a most important point for the consideration of shareholders before they venture to accept or uphold any plan for the liquidation and reconstruction of their presently very unfortunate concern.

You are also well aware, Sir, of the intimate connection which has existed between the Chile and the Guayana Company. A circular has been addressed to the shareholders of the latter inviting them to be present at the meeting; it is signed by Mr. Harvey, Chairman of the Guayana Company (and who is also Chairman of the Chile Company), states that—"Mr. Nicholson has brought an action against the company for salary and services rendered as the company's manager in Venezuela, and the company having no funds to meet this or other claims" shareholders "are requested to consider the present position of the company, and to pass such resolutions as the meeting may think proper." What resolutions will the Chile directors presiding over the destinies of the Guayana Company propose to the shareholders? Surely they cannot propose a reconstruction of a concern that was based upon contracts which have lapsed, and are now, it appears, not even worth the problematic value they ever had. Liquidation is, apparently, the only resolution which will have to be adopted by the Guayana meeting. What will be the assets which the liquidators will receive from the company? What resources will the liquidators be enabled to realise for the discharge of the company's debts? Shall the claims preferred by Mr. Nicholson and other officers of the Chile Company, whose services the *arcades ambo* directors obligingly lent to the Guayana Company, and the moneys spent for the Guayana in all appearances, but effectually people loudly say for the ultimate benefit and advantages of the Chile Company—shall all those be accepted by the shareholders of the Guayana Company without any protest or investigation?

The result of the Guayana meeting, in reply to the above questions, shall be, in every way, most interesting for a great number of people interested in the Guayana Company, which, it must be remembered, has not only issued shares, but also incurred other liabilities and responsibilities. The shareholders in the Chile Company will, no doubt, also find it interesting and useful, for many reasons, to ascertain the results of the Guayana meeting before they attend to decide anything for themselves at their own assembly.

London, Nov. 13.

C. W. D.

POPULAR FALLACIES ON PRECIOUS METAL ORE DEPOSITS.

SIR.—Mr. Albert Williams, Jun., of the Geological Survey, has published a little brochure "On Popular Fallacies on Precious Metal Ore Deposits." From its introductory one sees that it discusses the practical miners as well as theorist, and certain fallacious contributions to current literature. No new information is intended to be offered, and no fallacy is cited as having received universal credit. This latter, of course, cannot be if the former is true. This little brochure contains points to which exceptions can and should be taken.

Coming, as it does, from the Chief of Division of Mining Statistics and Technology, United States Geological Survey, this seems unfortunate, since contributions from his pen should be remarkable for accuracy and correctness. The laity is at least likely to expect this. Under the heading of "Local Prejudices against certain Formations and in Favour of Others" Mr. Williams says:—"All contacts, it may be remarked, are generally preferred to veins in a single rock, perhaps not without reason, notwithstanding the probability that contact-veins, in the nature of things, are usually more limited in extent than fissure-veins in homogeneous rock, excepting, of course, the type of fissures known as gash-veins." I fear Mr. Williams will see the day when he will regret having made this sweeping assertion. In future it will, no doubt, be frequently copied into prospectuses and reports made to sell contact deposits. The stereotyped expression of certain mine reports, "This is a true fissure-vein," which expression was supposed to tempt the public, *a priori*, into investing its dollars and cents will now bid fair to grow stale and obsolete. If "all contacts" is no typographical error I fear that Mr. Williams is guilty of enunciating and disseminating a new fallacy, which may be destined to grow popular. Contact deposits are, as is well known, metalliferous accumulations found on the plane of contact between dissimilar rocks. Why these accumulations should be, *ipso facto*, preferred to accumulations, veins, or lodes occurring in homogeneous rock I fail to see. I can understand how a contact deposit between a limestone footwall and a dissimilar hanging may be made to answer the case, if the hanging-wall (also any intruded masses) was once impregnated with mineral matter that was later carried in solution to the contact plane and into any caverns, caves, or other excavations, eroded by a water channel in the limestone, and deposited as minerals. (Mr. Emmons' Leadville theory—by no means universally accepted.) Also, in that instance, if the heated mineral solutions came up along the plane of contact of the limestone and felsite about the time when the porphyry dykes broke through, producing the same final results as Mr. Emmons' theory would. In short, preference "might" be expressed for a contact deposit, if one of the walls is a very much more homogeneous and soluble rock than the other—for example, a magnesium limestone. Here the eaten-out caverns, caves, or excavations may be found filled with ore, in addition to the ore found along the contact, and thus a heavier tonnage of ore per foot along

the deposit may result than would in a true vein in a homogeneous rock not shattered and soluble. But would this preference continue if the contact were found mostly barren and nearly all the ore in the limestone excavations?

Under "Deposits in Limestone," Mr. Williams cites Leadville as an example, while the fact is that the Leadville contact deposit is the typical contact, for which a preference "might" be expressed. The silver-lead deposits of Leadville occur as contact deposits, between the carboniferous blue limestone and an overlying felsite, broken through by porphyry dykes. In places only minute fissures run out from the contact to vugs, caverns, corves, or excavations in the limestone in which ore is found. The deposits of iron and carbonate hills are certainly plain contact deposits, and do not occur "as deposits in limestone." The best Mr. Williams can say of Fryer Hill is that it is a deposit "which once was a limestone." Speaking of sandstone, Mr. Williams says, when referring to the discoveries of Silver Reef, "A rock which had not been thought of as a possible home of ore is sandstone," and further on, he says, "And also because the geological age of the strata was not considered to be a favourable one." The circle of those charmed by this fallacy is widened, since now also such as are included are able to recognise a geological formation. The age of these rocks was not determined until the fall of 1879, while the mining and shipping of ore began in the winter of 1875. Hence the geological age of these rocks had prejudiced no one either for or against them. As a matter of fact, the man who condemns a district on the ground that it belongs to a certain geological epoch, and not to another, is, to say the least, a very rash man. Practical experience and development work in a given district may teach us that certain members of its geological series are barren or unlikely to contain ore in paying quantities; but no miner of sense will dream of generalising from that. It is the very reverse process of reasoning to this one that man has to combat with, since hope often runs away with the judgment.

That deposits of ore occurred in sandstone was a well-known fact at the time, and the miners who had worked in Europe in these districts and came to this country were aware of it. They were also aware of the fact that the American continent was not made to order, and, therefore, did not view our rocks with any rational doubts. I need only cite the famous Compton deposits in the triassic sandstone, which are of the same age as the Silver Reef sandstones; the lead ores in the triassic near Saarlos and St. Avoil; the gold occurrence in auriferous quartz veins at Vöröspatack, in Transylvania, which is found in the Carpathian sandstone; likewise at Fazebája, and the gold impregnations of the sandstone at Butsum, Szánisa, and Buckaresd. The permian sandstone copper deposits of Russia, about Tinst, Starkenbach, Hohenelbe, &c., which also carry tetrahedrite, occurring as they do with remnants of fossil plants, are so strikingly similar to the Silver Reef sandstones—which carry the more copper ore the farther south they are followed—that Mr. George W. Maynard suggested that the Silver Reef sandstones might be permian, because of their striking resemblance to the Russian deposits. In Chili, South America, similar copper sandstone occurs. The list might be continued, but what is the use? Did we not know that even New Jersey sandstones carried copper ore and silver? Mr. Williams's discussion of "the supposition that the richness of mineral veins usually increases with depth," if aimed at certain prospectuses that have been laid before the dear public for the sake of selling mining properties or getting the money to further develop them, is in place; but he really treats the subject too seriously from one side and not positively enough from the other. Mr. Williams hardly does justice to the intelligence of many of our Western precious metal "miners"—I mean those who follow mining as a vocation—when he thinks they believed his cited fallacy. There is no use in theorising at length either way; our present knowledge of the subject is not precise enough. So many local circumstances must have influenced the crustation and deposition, which, before developing the veins, are beyond our ken, and which may and do vary in different instances, that a candid expression, "we know not," is in place. The variations of grade in the ore, as well as the distribution of ore bodies in the veins are matters that the miner cannot decide *a priori* by looking wise while standing on the vein's outcrop.

There are, of course, certain changes in the occurrence of ores in veins with which the miner is familiar, and which influence, in certain cases, the richness of the ore or the facility with which the precious metals and others are reduced from their combinations. I mean the secondary influences on ores in veins. Apart from all primary changes, which are often only revealed in the *quasi* post mortem, and which cannot be predicted in virgin district when the particular horoscope is examined, unless in exceptional cases of faulting. I will say that true silver ores occurring in fissure veins in a homogeneous, not shattered and not soluble rock, outside of the reach of secondary influences, will, as a general thing, maintain their mineral character as to quality for present practical mining depth, while the quantity is an unknown factor. I have reference to those silver ores where the silver is a necessary chemical constituent of the mineral in fixed ratio, and where, by changing the ratio, the chemical formula would be destroyed. Austin, Nevada, and Andreasburg, on the Hartz, are good samples. The latter serves the double purpose of maintaining the quality of the ore and of the giving out of the quantity of the ore. It is different with ores like tetrahedrite and its varieties, where part of the copper may be replaced by silver in varying amounts from nothing to 31.29 per cent. without changing the character of the ore, where silver is seemingly not an essential constituent of the ore. The *a priori* constancy of the silver is not to be expected with the same degree of certainty. Rich spots and poor spots may be found in the vein on its strike as well as on its dip, outside of secondary influences and otherwise. The grade of the ore may change, though the quantity of the ore may remain constant. It would be foolish, however, to nurse prejudice on that account against these veins. I only cite a constitutional possibility.

Secondary influences are a different thing altogether. We know that the surface waters charged with carbonic acid and oxygen, as surface waters are, infiltrate the rocks downward, and oxidise the metallic sulphides. Chemistry teaches us that a part may be left in the place, a part carried in solution to receptacles where the condition for its deposition was favourable, be this inside or out of the vein. The iron pyrites is oxidised partly to the soluble sulphate, which is washed away, partly to the insoluble peroxide of iron, of known rusty colour. In the conversion of galena into carbonate of lead, an increase of 28 per cent. in volume takes place, according to Bischoff, and under the secondary influences 28 per cent. in volume of the original galena must be washed away as carbonate of lead. If originally ruby silver ores occurred with these, which contain sulphide of silver, antimony, and arsenic, 23.46 parts of the antimony, and 15.16 parts of the arsenic, with some of the sulphur, would be washed away, and the consequent diminution of volume would be 45.30 for the dark-coloured variety, and 39.38 in the light-coloured variety. If zinc blende is mixed with the ores, it changes under the action of atmospheric agencies to the soluble sulphate of zinc unless redeposited by other agencies it is carried away. See Leadville late ore developments. The conversion of grey copper ore yields, according to circumstances, different results, such as sulphides, oxides, oxyhydrates, arsenates, antimonates, and carbonates, while the oxidised sulphates are washed away. Thus, we see that the heavy metals must be often reduced in quantity under secondary influences, and with reference to their precious metal contents, a concentration has taken place. Gold is nearly always associated with iron pyrites or other metallic sulphides, which become decomposed near the surface, *quasi* liberating the gold. Out of reach of secondary action, these sulphides remain undecomposed, and this enhances their cost of reduction.

Silver sulphide is generally first converted into the metallic silver, the chloride of silver, &c., under secondary influences. Considering the foregoing, a decrease in the amount of metals, on going from the surface downward in the veins, is in many districts probable, and is really the case; certainly the precious metal ore carriers have a tendency to require higher beneficiating costs after they are met with in their normal state. There are abundant examples on which to base these remarks, such as the Comstock rich upper workings, Winnemucca, Raymond and Ely, and Austin, &c., and lately Leadville, with its zinc blende ore, comes to the front.

The very contrary to Mr. Williams's fallacy has had pet advocates—that "gold veins give out in depth." With some segregated gold veins this may, no doubt, be the case; but, as no two veins are probably formed exactly alike, it will not do to generalise. Much of the abuse that has been heaped on gold veins is, no doubt, due to the fact that the undecomposed sulphides concealed the gold below secondary influences. Others have, no doubt, been abandoned because the direction and pitch of the chimney in which the irregular ore bodies lay was not carefully studied and taken into consideration, and others, again, have no doubt been abandoned for lack of funds. Mr. Williams, in discussing atmospheric action that decomposes the base compounds, says that organic substances reduce the gold minerals to the metallic state. Organic substances do nothing of the kind. In certain cases they reduce gold when in solution. Specimen Mines: I do not think the practical miner objects to veins because of the unusual richness in their gold contents, but rather because the gold in such mines seems irregularly distributed in pockets and nests, and appears, like angels' visits, few and far between. Of course, there may be veins, all of whose gold, being derived from the adjoining country-rock by a process of concentration that had originally very little to get, is now massed in one pile. But how can the miner make this diagnosis beforehand and have a base for his prejudice? That silver mines with exceptionally rich ore in quantities are not void of low-grade ore and fair-grade ore, I think the late Lake Valley Mines have demonstrated; and since the true silver ores are usually found in narrow veins, as Mr. Williams rightly cites, I do not see where Mr. Williams scores his point.

Discussing "the prejudice against blanket deposits and veins of small dip," Mr. Williams cites as one the uncertainty of title from the United States. I should call this a decided objection, and not a prejudice. In discussing the economic consideration of flat deposits, Mr. Williams loses sight of the superincumbent pressure and the nature of the overlying rock, which, on Fryer Hill at least, required very heavy timbering. As to Silver Reef, I do not know but that parts of the camp would have been better off if the strata had been tilted into a vertical position. I think it would have been a relief to those inconvenient grades that neither allowed of chuting the ore down nor of wheeling the ore up by barrow or hand car. It is true to some of the mines the flat dip was a relief.

CHARLES M. ROLKER,

In New York Engineering and Mining Journal.

MINING LAW OF NEW MEXICO.

SIR.—Observing in the *Mining Journal* of Oct. 11 that you quote what is termed the territorial law in relation to mining claims in New Mexico, I would draw the attention of your readers to the following facts concerning it:—In the Act quoted by you, and which was undoubtedly passed by our last Legislature, it is enacted that a miner must, within 90 days after locating, do what is equivalent to \$100 worth of work. Now, permit me to say that, while this Act was passed, it is perfectly illegal and inoperative, for the good and sufficient reason that the territorial Legislature had no power to pass any law conflicting with the United States general mining law.

Permit me, further, to give that portion of the United States mining laws that regulates this matter, and I give it as taken from an official letter of N. C. Macfarland, the United States General Land Commissioner. It is as follows:—Sept. 12, 1881.—I have to state that the Act of Congress, approved Jan. 22, 1880, provides that the period within which work required to be done annually on all unpatented mineral claims, shall commence on Jan. 1 succeeding the date of the location of such claim. This being the law, you will at once perceive that the territorial Act falls to the ground of its own illegality.

After a patent is granted, the owner is under no obligation to do any work at all unless he sees fit to do so. In making known these facts, I do not presume to pass any opinion as to the wisdom, or otherwise, of the Legislature in passing the 90 day Act. In some cases it might be an advantage, as some miners are addicted to making a number of locations without making any effort to develop them, to the injury of the camp; while in some other cases it would work as a great hardship, as prospectors are generally poor men, who would in many cases be unable to do the work within the 90 days from lack of funds.

There is one thing certain—the 90 day Act was not gotten up in the interest of the poor miners, but in the interest of the monied schemers, who thought that by its provisions they would be able to secure valuable properties without the trouble and expense of prospecting for them. Be that as it may, however, the Act itself is not worth the paper it was printed on, and only stultifies the so-called legislators who, in their wisdom, passed it, and the executive who approved it.

Las Vegas, Oct. 28.

EDINBURGH GEOLOGICAL SOCIETY.—The 51st anniversary meeting was held in the Society's Library, St. Andrew-square, on Nov. 6, Mr. David Milne-Hume, LL.D., occupied the chair, and gave a statement of the present position of the society, from which it appeared that there were 176 ordinary members, 55 foreign corresponding members, 24 associates, and nine honorary members, in all 264. The accounts showed a deficiency of 307. During the session 17 papers had been read, which would afford material for Vol. IV. of the Transactions. There had been during the summer an excursion to Largo, in Fife, where raised beaches had been examined, and another to view excavations along the line of the Edinburgh Suburban Railway. The following were the chief office-bearers elected for the ensuing session:—Patron, His Grace the Duke of Argyll; President, Mr. David Milne-Hume; vice-Presidents, Messrs. W. Ferguson and Ralph Richardson; and hon. secretary, Mr. W. Ivison.

THE BLACKLOCK POWDER MILL EXPLOSION.—The result of the enquiry by Colonel A. Ford, H.M. Inspector of Explosives, into the cause of the explosion which took place last July at the Blacklock Powder Mills, resulting in the loss of four lives, has just been published. It seems that on the day in question four men were engaged at work in the corning-house, a wooden building with a corrugated iron roof, to which a lightning conductor of copper rope was attached. It having come over very dark one of the men went outside to see if a thunderstorm was not approaching, when immediately there was a flash of lightning, and the building was blown up, the three men inside being instantly killed, the fourth lingering until the next morning. There was no trace of the lightning upon the conductor, upon the ground near the corning-house, or upon any of the debris of the building; but there can be no doubt that the lightning was the cause of the explosion. But from subsequent examinations of the spot it was discovered that the lightning had struck a tree about 250 yards off, and Colonel Ford has come to the conclusion that although the explosion was caused by the thunderstorm it was not brought about directly by a flash of lightning. A corning-house is unavoidably covered both inside and outside with powder dust, which falls into the crevices, and would serve as a means of conveying flame with great rapidity from one part of the building to another, or to gunpowder inside the building. The lightning conductor was also defective at more than one point, particularly the machinery at the back of the building was connected with the conductor by a copper rope, the strands of which were twisted round the main rope at a point near the ground without being soldered to it. When the electric cloud approached the machinery became charged with induced electricity more rapidly than the imperfect conductor could convey and transmit it to the cloud. Suddenly the flash took place, the cloud was discharged, and with equal suddenness the electricity in the machinery was free to return to the earth, and at once attempted to discharge itself through the copper rope. At the junction of the copper rope with the main conductor, owing to the imperfect connection, there must have been considerable resistance, and the breaking across that imperfectly conducting space caused a spark. A defective conductor is, therefore, worse than none at all. It is desirable that all important danger buildings in a factory for explosives should be protected by lightning conductors properly constructed, and that care should be taken that they are periodically tested.

QUEENSLAND GOLD DEPOSITS.

At a meeting of the Royal Society of New South Wales, on Sept. 12 (the Hon. A. C. Gregory in the chair), an interesting paper by Mr. JOHN FALCONER, M.E., was read. The author first treated of the occurrence of gold associated with copper ores, and remarked on the auriferous nature of all copper lodes which he had visited in Queensland, making special reference to Rawbelle, Mount Perry, Mungo, Cania, Dee, Camboon, Boobygan, Black Snake, Kilkivan, Ban Ban, Marodin, Trebar, Cooyla, Crossbrook Creek, Charters Towers, and Cloncurry. Gold was also met with in felstone porphyries, and especially at Nananga, Ban Ban, and Kilkivan. Under both these conditions the gold to a great extent refused to yield to the ordinary methods of crushing and amalgamation, but when parts of these copper lodes or felstone porphyries had become decomposed by ordinary atmospheric agencies it was observed that the gold was liberated to the extent of this decomposition, and occurred as free gold in the resulting products. This and the plentiful yield of gold by the residue of heaps of copper ore which had been subject to protracted exposure had suggested to the author as the most feasible method for recovering the gold, the systematic exposure of ores of this nature, or with a view to hastening the process, that the class of changes exerted by ordinary atmospheric influences should be experimentally induced by chemical means, which need only be of a simple and inexpensive nature. It was next remarked that minerals, and gold especially, were found to be deposited or aggregated along lines nearly related to those marking the magnetic meridian of the locality, and generally followed a course $3\frac{1}{2}$ ° east of north of them; moreover, this direction was that of the leads in gold reefing countries, irrespective of the direction of the reef. A consideration of this fact would guide the investigation of prospectors, who should seek gold with a greater probability of success in places which are off the lines produced in this direction through known auriferous deposits. Exceptions to the above rule were to be explained by the occurrence of secondary reefs; but in these cases also the disposition affected by the gold was in accordance with certain general laws, some of which the author enumerated. He then went on to mention the conditions under which gold was found in reefs which had been affected by faults, and which had been subjected or not to further disturbances, such as launching end ways, &c., describing one of the reefs at Kilkivan in illustration of this mode of occurrence. After touching upon the association of gold with galena and antimony, allusion was made to auriferous conglomerate, where, judging from what was met with at the Palmer and Hodgkinson, the gold appeared to be confined to the cemented conglomerate, and did not extend to the loose drift intervening between it and the base rock. Gold was also stated to exist beneath basaltic overflows, as on the Normanby, in the Cook district, where once the bed had been bottomed, circumstances especially favourable to its occurrence were said to occur. After remarking on the physical appearances which characterised the alluvial grounds on the Hodgkinson and the Palmer, the absence of a knowledge of the mechanics of geology amongst those located in mining districts to the detriment of commercial interests was specially dwelt upon. Mr. Falconer accompanied his descriptions by graphic illustrations.

This was followed by "Observations on the Occurrence of Gold at Mount Morgan, near Rockhampton," by the Hon. A. C. GREGORY. Having alluded to the interest which had been created by reports of the discovery of gold under exceptional circumstances in this locality in the Dee Ranges, the author commenced by describing the character of the ore which had given rise to this state of things. This, he remarked, presents itself as a cellular quartz, the cavities of which are occupied by a ferruginous rust, with which very fine gold, in a free state, is associated. The quartz itself is similar in character to the ordinary aqueous deposits of metalliferous veins, as is evident from the structure of the interior surfaces of the cavities, formerly contained cubical pyrites or mundic disseminated through it. Thus it originally formed a metalliferous deposit consisting of iron pyrites with a gangue of quartz, which, under the combined action of atmospheric air and water, had resulted in the ore as described. Having alluded to the general geological features of the district and the conditions which it presented at Mount Morgan favourable to the occurrence of metals—a granitic anticline flanked by thick beds of serpentine rocks and altered slates of Devonian age, accompanied by veins of magnesian silicates; the author, from the nature of the specimens which he had examined, inclined to the opinion that the workings were situated on a blow, or special enlargement, which would eventually be found to be in the course of a well-defined lode. He had reason, too, to anticipate that this enlargement would be of considerable dimensions even at a much lower level than mining operations had yet reached, but that when once the water line was attained the ore would be found to alter its character and pass into an auriferous mundic, from which the gold could only be separated with difficulty. It became, therefore, desirable to consider a method adapted for the recovery of the gold under this circumstance, which would be found in roasting the ore with a view to drive off the sulphur, an operation which must be performed at a low temperature, lest, as usually happens, the mass become partially fused, and the gold hopelessly entangled in it.

The importance of this information will be appreciated when it is remembered that they state that "the gold deposits of Mount Morgan have been valued at nine millions of money. Now, there is something worth talking about with such a mouthful!" Another correspondent writes that "the Minister for Mines did the right thing last week in assenting to Mr. Norton's motion in favour of a special report by Mr. Jack, the Government geologist, upon the Mount Morgan Mine. Since the first discovery of gold in Australia many important finds have been made, but no such geological developments, if we may be allowed the expression, as those of Mount Morgan have hitherto been seen. The appearance of the gold-bearing material is most unpromising, for the matrix in this case looks just like a poor kind of burnt ironstone. Nobody who has been familiar with gold mining would suspect it of containing the rich ingredients which it has been proved to possess, and it seems a wonder that anyone should have found the gold that is now known to be there. The incident indicates very forcibly that, notwithstanding the experience which has been gained both in Australia and in other gold-producing countries, there is an immense fund of knowledge in connection with the miner's business which has yet to be tapped."

HEALTH ON THE GOLD COAST—WEST AFRICAN HYGIENE.—Since mining, or what has been called by that name, has been carried on by English companies, whose properties are on the Gold Coast, the question of the healthfulness or otherwise of the region has frequently been discussed by correspondents in the *Mining Journal*, and the most reasonable conclusion to be drawn from the discussion was that although the place is by no means healthy fair health may be enjoyed by carefully attending to simple rules, and by resorting to proper remedies immediately an ailment shows itself. This view is fully confirmed by the statement contained in the pamphlet just issued for the Government of the Gold Coast Colony—West African Hygiene, or Hints for the Preservation of Health and the Treatment of Tropical Diseases, more especially on the West Coast of Africa. By CHARLES SCOVELL GRANT, M.D., Univ. Dubl. Second edition. London: Edward Stanford, Charing Cross—intended for the information of Europeans, not belonging to the medical profession, who may be called upon to reside there. General advice towards the preservation of health is followed by a chapter on medical and other preventive measures against diseases peculiarly incidental to the Coast, and there is then detailed information as to the treatment of biliousness, malarious fever, diarrhoea, and dysentery, skin diseases, yellow fever, and cholera. The symptoms by which the several diseases may be recognised, and the remedies to be applied are clearly and carefully described, and by strict attention to directions the person attacked with sickness has a fair chance of recovering. There appear to be several interesting little entomological curiosities which those going to the Gold Coast may have a chance of studying; one is the Guinea worm which, however, rarely attacks white men unless they go about bare-footed; its favourite seat is the ankle or the adjacent parts of the foot or leg. Dr. Grant explains that it is attended with much inflammation and pain. It reveals its

presence either by a small circular ulcer, in the centre of which the head of the worm may generally be discovered, as a yellowish white spot or inflammation is set up in the tissues beneath the skin, and an abscess forms on the bursting or lancing of which the worm will be found. Hot poultices and sea water baths are the remedy, and Dr. Grant's directions are to secure the worm as soon as practicable on a piece of stick, or roll of card, or sticking plaster. Continue poultices and wind out worm gently and gradually day by day until the slender hooked tail is drawn out. The worm, he adds, must not be broken, as severe inflammation and ulceration is likely to follow such an accident, and the ova dispersed into the tissues will develop to the future periodical trouble of the patient. The chigger or sand flea, and the craw-craw appear to be equally amusing little creatures. The reminder "Once sunstruck, always sunstruck" will suffice to make the cautious man use his umbrella, and Dr. Grant's graphic description of the more constantly observed and distinctive phenomena connected with yellow fever—he avoids confusing details of the different kinds of yellow fever—from the commencing headache to the bloody vomit and delirium, and hence through the stages of remission to recovery, or to the black vomit and death will not commend the Gold Coast as a health resort, but with the other information will be extremely valuable to those for whom the book is intended.

THE HAMBURG LOTTERIES.

The caution against entrusting money to Hamburg lottery agents, published in last week's *Mining Journal*, and which we have periodically given for several years past, was re-echoed and enlarged upon by the Standard on Thursday morning, the writer remarking that this country is again being flooded with the circulars of the Hamburg lottery agents, and to judge by the examples of these remarkable documents which are before us, it seems to be high time that the attention of the authorities were directed to the traffic. It is notorious that these circulars are sown broadcast throughout England. Periodically—and at Hamburg a lottery seems to be perpetually passing through one of its stages—they are delivered to even the poorest inhabitants of our most remote country villages and the youngest clerks of the most populous cities. The fact that their number increases every year is a sufficient proof that it is a lucrative calling, which trades upon ignorant cupidity. It is scarcely necessary to say that such an avocation can only be safely followed from foreign soil, for if any of these harpies were foolish enough to ply their trade in England they would soon find themselves in the clutches of the law, and be dealt with as rogues and vagabonds. And this fact serves to accentuate the anomaly presented by their being permitted to prey upon the British public through the post without let or hindrance. It matters not that this means of raising revenue is sanctioned by needy German States—indeed the fact that they are guaranteed by Government lends them an adventitious respectability, and really heightens the evil. It is indisputable that this form of gambling has a most pernicious effect upon public morality. It has been proved over and over again to be the parent of fraud and dishonesty, and the enemy of industry and thrift, and the policy which has put down lotteries in this and other countries is fully borne out by results. It is, then, intolerable that foreigners should not only act in defiance of our laws, because they are out of the jurisdiction of our courts, but should actually reap a rich harvest by so doing. The fact that lotteries are forbidden in England renders this opportunity of "courting fortune's favours," as these circulars put it, all the more tempting; and it is to be feared that the illegality of these dealings makes them the more attractive, on the principle of stolen pleasures being sweetest. Moreover, the agents make every effort to bring the bait within the reach of all. The stakes in the various drawings are divided and sub-divided into halves, quarters, and sometimes eighths and sixteenths. Considerable ingenuity, too, is exercised in obtaining the names and addresses of those likely to be taken in by these specious offers. In a recent case, for example, a certain Hamburg "banker" applied to the mistress of an English village school for the names of shopkeepers, farmers, and artisans in that and the neighbouring villages, promising "immediately after having received these addresses to remit for each hundred, provided they are written distinctly and carefully, 2s."

The most cursory study of any one of these interesting documents will afford a striking illustration of the depths of human credulity. It is scarcely possible that any intelligent, much less any educated, person could for one moment be taken in by such a transparent tissue of fraud and falsehood. Whatever status the "bankers" of Brunswick and Hamburg, from whom these documents come, may hold in those Free Cities, in this country they would probably be relegated to much the same category as the members of the "long firms." They are certainly adepts at drafting attractive circulars, which are so worded as not to bring their authors within reach of the criminal law. One of those which lie before us, for instance, bears in large red capitals the announcement "much money to be won," which is quite enough to rouse the attention of most people. Great stress, too, is laid upon the fact that "this undertaking, established, controlled, and guaranteed by Government itself, is thus very far from being a private undertaking." This can only be regarded as an ingenious, although superfluous, waiver of any claim to personal probity. We are informed that of the 100,000 tickets "50,500 will be drawn with prizes," by which it is made to appear that the chances are more than two to one in favour of any particular ticket winning a prize, odds which, in the eyes of many people, are quite good enough to make these tickets a much more desirable investment than, for instance, the Post Office Savings Bank. Further, we are assured that among the prizes is one of "500,000 marks, to be won in the likeliest (*sic*) case," and beneath is "500 in huge capitals a list of prizes ranging from 300,000 to 94 marks. The inference that any one purchasing a ticket has a better chance of winning one of these prizes than is not obvious. It is true, however, than the extract of the official prospectus which accompanies the circular does something to explain this apparently phenomenal philanthropy. From this it appears that the lottery is divided into seven classes, the respective drawings of which extend over a period of six months. The prizes are divided among these drawings, and the stakes vary from 6 marks in the first and 12 marks in the second, to 24 marks in the fourth, fifth, and sixth. The tickets which are now offered for subscription relate only to the first drawing, in which the highest prize is only 50,000 marks, so that the pretence that any one purchasing one or more of these tickets has any chance of winning 25,000*l.* is absolutely false. This great prize of the lottery is reserved for the seventh and last drawing. A further examination of the figures seems to show that the number of tickets which will be drawn with prizes cannot possibly exceed 5 per cent. of those issued. But the exact chances any subscriber has of winning a prize would make an interesting problem in probabilities. His chance of ever receiving his winnings could, however, probably not be represented by any known system of notation. The agents obtain the tickets at a considerable reduction, usually 25 per cent., and retail them at rather more than their full facial value, since a shilling is an excellent exchange for a mark. Besides, there are advantages in being present at the allotment and drawing, which still further reduce the chances of English subscribers, and convict them of folly in entrusting their money to those unscrupulous touts.

But we have said enough to show by what unfair and tricky methods the Hamburg lottery is puffed in this country. If enquiries were instituted it would, doubtless, be found that the evils resulting are much more widely spread than would be supposed. We have already pointed out that these agents advertise themselves and their wares to much better purpose among the needy and ignorant classes. In one case, which was made public at the time, it was found that an old woman in receipt of parish and private relief had been in the habit of laying out these moneys in the purchase of tickets for the Hamburg lottery. The fact was, moreover, only discovered when the poor deluded creature was in an advanced stage of starvation. Many a gaol-bird has been tempted to take the first downward step by this means. The chances of winning a fortune seem so great, and those of detection so small, that it is not to be wondered at that this form of temptation should often prove too strong to be resisted. But our own Statute Book sufficiently illustrates

the drift of public opinion in England on this form of gambling; and, although the restrictions may be sometimes evaded, this is certainly not done to any great extent. In many parts of the Continent, of course, lotteries are still the rage. Manufactories, estates, and even lordships, are frequently disposed of in this way, and impoverished Governments find no difficulty in raising supplies by leasing the right to hold a lottery. We have only to turn to the record in the history of Italy, France, Spain, and even our own country to find a formidable catalogue of financial and social troubles which can be readily traced to this cause. The economic unsoundness of such a source of revenue has been demonstrated over and over again, but we are not now concerned to discuss this question. If the Chancellors of the Exchequer of Hamburg and Brunswick choose to adopt medieval financial methods it is no concern of ours, any more than are similar practices in some of the United States. But we are very closely concerned with the fact that England is becoming a happy hunting ground for the promoters of these schemes. And the question is, whether the time has not arrived when some legislative action is desirable. It should not be difficult to devise restrictions which would exercise the ingenuity of these foreign bankers for some little time to come. A judicious extension of the schedule of the Extradition Treaties, and an official interdict upon papers of this kind being carried through the post, are, amongst others, proposals which, if adopted, would tend to produce the desired results.

MINING AND METALLURGICAL PATENTS.

Supplied by Mr. ERNEST DE PASH, of Fleet-street, E.C., Fellow of the Institute of Patent Agents.

Amongst recent applications for patents, in which the readers of the *Mining Journal* are more immediately interested, are the following:—W. White, London, No. 14,563, Manufacture of aluminum chloride. E. de Pas, London (communicated by E. Sécrétan, Paris), No. 14,564, Manufacturing tubes in steel, iron, homogeneous iron, alloyed iron, pure or alloyed copper, and all other pure or alloyed metals.—J. Whately, London, No. 14,642, Manufacture of moulds for casting cylindrical forms in steel and other metals, or compounds of metals.—A. Lambotte, Brussels, No. 14,672, Process for recovering tin from tinplate scrap and other materials, such as oxidised metal and residues.—A. Sailler, Witkowitz, No. 14,690, Process of, and means for equalising the temperature in cast steel ingots.—A. Swan, London, No. 14,717, Manufacture of ornamental surfaces of combined metal and glass, or the like.—J. Riley and W. Crossley, Glasgow, No. 14,736, Manufacture of steel and furnaces for melting and treating iron, steel, or other substances.—T. L. Ellis and J. Cherrie, Glasgow, No. 14,743, Mechanism for rolling, straightening, and finishing bars of tubes of metal.—J. Lardon, London, No. 14,773, Rollers for compressing shaped metallic pieces.

The following selected specifications have been recently published, and are now open to inspection and opposition:—

MANUFACTURE OF TUNGSTIC ACID AND ITS COMPOUNDS.—A. K. Huntington, Westminster, No. 222.—By melting to a liquid condition tungsten ore in admixture with alkali, separating the tungstate from the slag, dissolving the tungstate in water, treating the solution with lime which precipitates insoluble tungstates; these being then treated with an acid so as to precipitate tungstic acid.

TREATMENT OF SCRAP ZINC FOR THE RECOVERY OF ZINC AND SOLDER.—A. K. Huntington, Westminster, No. 224.—The scrap is washed, melted, and as the mass cools it subsides into two layers of zinc and solder respectively, which are then separated from each other.

APPARATUS APPLICABLE TO ROCK-DRILLS.—J. Stocks, Ilkston, No. 1140.—A sleeve is formed in two parts, and hinged together at one end, the other end being screw-threaded to receive the stem of a drill socket. When the stem has been worked into the sleeve it may be removed by opening this latter on its hinged joint.

RAILWAY SLEEPERS AND CHAIR COMBINED.—J. Chater, Bengal, No. 1722.—The sleeper is cast with recesses to receive two jaws, which grip the rail, the jaws being held in place by a tie bar and keys.

MACHINERY OR APPARATUS FOR CUTTING, GROOVING, AND SHAPING METAL.—J. Craven, Leeds, and G. B. Wood, Sheffield, No. 2832.—This refers to that class of machines in which revolving cutters are employed. According to this invention a bed carries the cutter headstock, and is so arranged as to be above the object to be operated upon, the cutter being adjustable to any desired angle.

SEPARATION OF LEAD FROM PRECIOUS METALS.—E. H. Russel, Park City, U.S.A., No. 5430.—A hyposulphite solution of the cinnamyl metals is treated with a soluble carbonate.

MANUFACTURE OF ARTIFICIAL STONE.—E. Johnson, Cowes, Isle of Wight, No. 6556.—Coal dust and powdered chalk are mixed together, moistened with water, and pressed into blocks.

TREATMENT OF ORES CONTAINING SULPHIDE OF ANTIMONY, FOR THE PURPOSE OF OBTAINING THE SAID SULPHIDE IN A CONCENTRATED FORM.—J. Simpson and E. W. Parnell, Liverpool, No. 11,827.—The ore is ground and treated with a solution of a fixed alkali or alkaline sulphide, and the same agitated until the sulphide of antimony is dissolved; the gangue is then removed, and the solution treated with muriatic acid, to neutralise the alkali and precipitate the sulphide of antimony.

PURIFYING MOLTEN IRON OR STEEL.—J. E. Atwood, Brooklyn, U.S.A., No. 12,182.—An amalgam of quicksilver and lead is mixed with the iron or steel when in a molten state.

DRIVING GEAR OF MACHINES FOR PLANING OR SHAPING METAL.—G. Wilkinson, Keighley, No. 12,196.—Instead of the driving pinion taking directly into the rack of the travelling table, a wheel having internal and external teeth is interposed.

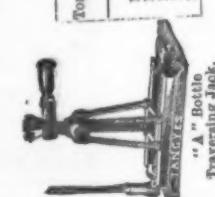
DOLGOATH—DAKOTA TIN.—At the meeting on Monday (Capt. W. Rabbing in the chair), the accounts showing a profit of 5013*l.* 3s. 1d. were passed, and a dividend of 2*s.* per share was declared. The agents reported that the development of the mine was proceeding satisfactorily. In supplementing his report the manager remarked that they had done important work since the last meeting. Finding that something must be done to the front wall of the sump engine-house, which was built 70 years ago, they had placed new iron plates on the walls and some granite, 5 ft. or 6 ft. square, which they believed to be sufficient. The engine at Wheal Harriett shaft was getting poor, therefore a new one of larger size had been supplied. It was more economical, and necessary for the further development of the mine. The eastern shaft was not yet enough explored to know much about it; but 70 or 80 years ago it was worked for copper. A large quantity of stuff was then drawn up, and Capt. Pearce was of the opinion that a great portion of it was carried away for tin. It was expected that as the shaft got down it would be productive of tin. He did not care to say much about the future price of tin, but every rise of 2*s.* in the standard would make an increase of 2*s.* in the dividend. Referring to the Blue Book recently published in Philadelphia respecting the discovery of tin in Dakota, Mr. Pearce observed that many present remembered the scare caused some 12 months ago from various reports there. He had an analysis from an eminent mineralogist, and the tin spoken of by an American mining company was no tin at all. Tin, however, was being found at what might be called "stream tin," but on examination what was thought to be tin in many cases turned out to be tantalite. Mr. Pearce added that there was nothing at present to seriously affect the interest of Cornwall. A railway had first to be constructed to Dakota before any progress could be made, and after that he had no doubt America would have to be supplied very largely from England as heretofore.

HOLLOWAY'S OINTMENT.—Go where you may, in every country and in all climates persons will be found who have a ready word of praise for this ointment. For chaps, chafes, soaks, bruises, and sprains, it is an invaluable remedy; for bad legs caused by accident or cold it may be confidently relied upon for effecting a sound and permanent cure. In cases of puffed ankles, crystals, and rheumatism, Holloway's ointment gives the greatest comfort by reducing the inflammation, cooling the blood, soothing the nerves, adjusting the circulation, and expelling the impurities. This ointment should have a place in every nursery. It will cure all those manifold skin afflictions, which, originating in childhood, gain strength with the child's growth.

TANYES
LIMITED
CORNWALL WORKS

BIRMINGHAM.

TANGYES' SCREW LIFTING JACKS.



BOTTLE TRAVERSING JACK "A."

Wrought-Iron case.

Height when down.

Length Traverse.

PRICE.

Tons.	Diam. Screw.	Height down.	Length Traverse.	PRICE.
8	2 1/2 in.	24 in.	6 1/2 in.	£2 18 0
10	2 3/4 in.	24 in.	9 in.	£2 18 0
12	2 3/4 in.	24 in.	12 in.	£2 18 0
15	2 3/4 in.	26 in.	12 in.	£2 18 0
18	2 3/4 in.	27 in.	16 in.	£2 18 0
20	3 in.	27 in.	22 in.	£2 18 0

Top Nut H of Brass, extra.

Top Nut H of Steel, extra.

Traversing Jack.

"A" Leg.

Traversing Block.

N.B.—This Jack may be had with Brass Case, instead of Steel, at an extra price.

132.

"B" WOOD HALEY JACK.
The Worms and Wheelcase are of
harnessed Iron, case hardened.

Height when down.

Length Traverse.

PRICE.

Tons.	Diam. Screw.	Height down.	Length Traverse.	PRICE.
8	2 1/2 in.	24 in.	6 1/2 in.	£2 18 0
10	2 3/4 in.	24 in.	9 in.	£2 18 0
12	2 3/4 in.	24 in.	12 in.	£2 18 0
15	2 3/4 in.	26 in.	12 in.	£2 18 0
18	2 3/4 in.	27 in.	16 in.	£2 18 0
20	3 in.	27 in.	22 in.	£2 18 0

Brass Case.

TANGYES' SCREW LIFTING JACKS.



HA



I



K



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O



D



G



F



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C



B



A



H



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BB



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FF



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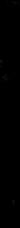
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AA

THE BLAKE-MARSDEN NEW PATENT IMPROVED STONE BREAKERS AND ORE CRUSHERS.

ORIGINAL PATENTER
AND ONLY MAKERH. R. MARSDEN,
NEW PATENT FINE CRUSHER OR PULVERIZER,
FOR REDUCING TO AN IMPALPABLE POWDER, OR ANY DEGREE OF FINENESS REQUIRED.GOLD QUARTZ, SILVER, COPPER, TIN, ZINC, LEAD
AND ORES OF EVERY DESCRIPTIONPATENT REVERSIBLE CURING and CRUSHING
JAWS, IN FOUR SECTIONS,
WITH PATENT FACED BACKS, REQUIRING
NO WHITE METAL IN FIXING.CRUCIBLE CAST-STEEL CONNECTING RODS.
RENEWABLE TOGGLE CUSHIONS, &c.

OVER 4000 IN USE.

EXTRACTS FROM TESTIMONIALS.
PULVERIZER.

"I have great pleasure in bearing testimony to the merits and capabilities of your patent combined fine crusher and sieving apparatus. I have tried it on a variety of ores and minerals, and it pulverizes them with equal success. You can put in a small paving stone and bring it out like flour."

"In reply to your favour, I have much pleasure in informing you that the 12x3 Pulverizer we had from you is giving us every satisfaction. The material we are operating on is an exceptionally hard one. I am well satisfied with its working."

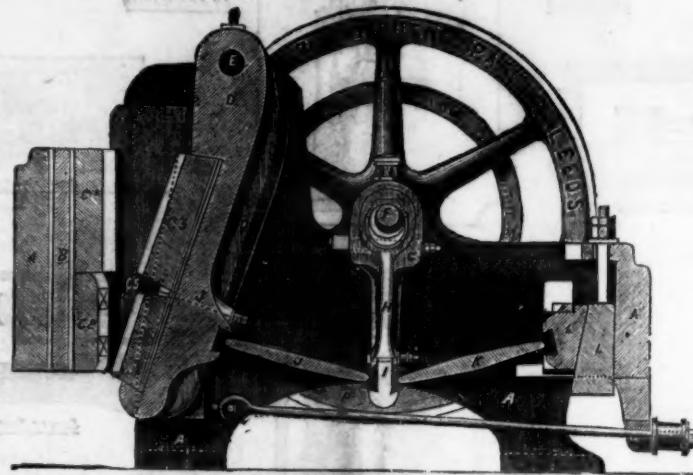
"Our experience is that the motion and mechanical arrangements of your machine are the best for pulverizing that we have ever met with."

"The reports from our mines as regards the working of your Fine Crusher (20x5) recently supplied are very favourable, although we cannot quote you exact figures. On being got into position it was tried by hand, with the result that it made short work of the biggest pieces of ore we put into the hopper. You might say how long you would take to deliver another of the same size."

"As I once before stated, your machine is a perfect pulverizer."

"I am sure the machine will be a success, and a great one, and there is any amount of demand for such a machine. We can work it with 20 lbs. of steam, and our engine, which is a 12-h.p., plays with the work, in fact we run the Stonebreaker and the Pulverizer both together with 35 lbs."

Also Cement, Barytes, Limestone, Chalk, Pyrites, Coprolite, &c., &c. These Machines are in successful operation in this country and abroad, and reference to users can be had on application.



GREATLY REDUCED PRICES ON APPLICATION.

FOR CATALOGUES, TESTIMONIALS, &c., APPLY TO THE SOLE MAKER,
H. R. MARSDEN, SOHO FOUNDRY, LEEDS.

AWARDED OVER

60

FIRST-CLASS GOLD AND SILVER MEDALS.

ADOPTED BY THE PRINCIPAL CORPORATIONS, CONTRACTORS, MINING COMPANIES, &c., IN ALL PARTS OF THE WORLD.

ROAD METAL BROKEN EQUAL TO HAND, AT ONE-TENTH THE COST.

EXTRACTS FROM TESTIMONIALS.—STONEBREAKER.

"I now order Three of your Stone Crushers, size 15 x 10, to be of your very best construction, and to include two extra sets of Jaws and Checks for each. The last two 24x13 machines you sent me, which are at work in this colony, are doing very well. You will soon find that the railway contractors will adopt your machines in preference to the colonial ones—two of which I have. I know other contractors have had as many as nine of them, which have not given very good satisfaction. Once they know of yours thoroughly, I believe you will do a good trade with the colonies. For reference of the high character of your constructions you can refer to me as having used them with the very best results, both in New Zealand and this colony, and much prefer them to the colonial article, both in point of construction and less liability to go out of order. The material we are crushing is very hard blue stone, for railway ballast purposes. Push on with the order as quickly as possible; I do not think it necessary to have any engineering inspection. I have brought your machines prominently under the notice of all large contractors in this colony, likewise the Government. Many of the contractors have spoken to me in reference to their capabilities, and I could only tell them that they are by far and away the best and most economical I ever used. The very last of me having purchased now Eleven from you at various intervals and various sizes, and two above 12 years ago, and having tried all the other makers, is sufficient guarantee of the capabilities and the working of your machines. Yours in every way surpass all others."

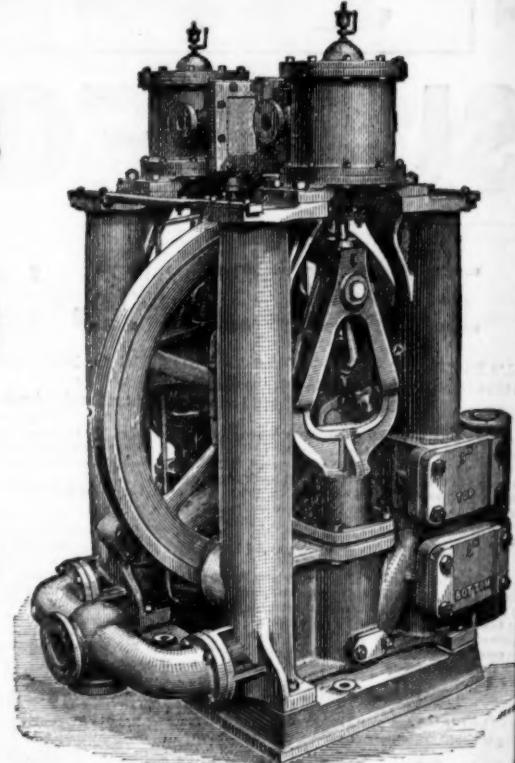
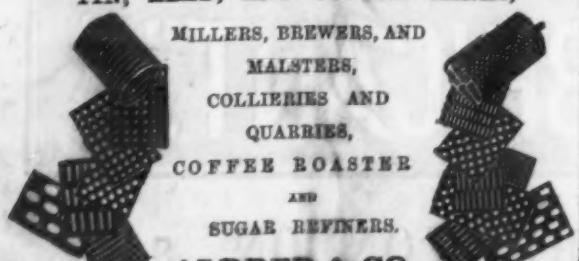
"Some of your testimonials do not give your machines half their due. I have seen men hammering away on a big rock for a quarter of a day which your machine would reduce to the required size in a quarter of a minute. I would guarantee that your largest size machine would reduce more of the Cornish tin caps (which is the hardest rock of England) in a day than 200 men, and at 1-25th the cost."

JOHN CAMERON'S
SPECIALITIES ARE HIS
STEAM PUMPS
FOR
COLLIERY PURPOSES.
Specially adapted for forcing Water any height
ALSO, FOR
SINKING, FEEDING BOILERS AND STEAM
FIRE ENGINES,
Of which he has made over 9000.ALSO, HIS
PATENT CAM AND LEVER
PUNCHING & SHEARING MACHINES.Works: Oldfield Road, Salford,
Manchester.AGENTS
For LONDON and DISTRICT—PRICE and BELSHAM,
52, QUEEN VICTORIA STREET, E.C.
For NEWCASTLE and EAST COAST—E. BECKWITH and CO.,
BONNERSFIELD, SUNDERLAND.

DISENGAGING APPARATUS.

HEPBURN'S.
+ PUMP LEATHER +
WATERPROOF

By a special method of preparation this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

HEPBURN AND GALE, LIMITED,
TANNERS AND CUIRERS.LEATHER MILL BAND AND HOSE PIPE MANUFACTURERS,
LONG LANE, SOUTHWARK, LONDON.Prize Medals, 1851, 1855, 1878, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.PERFORATED SHEET METALS
FOR
TIN, LEAD, AND COPPER MINES.MILLERS, BREWERS, AND
MALSTERS,
COLLIERIES AND
QUARRIES,
COFFEE ROASTER
AND
SUGAR REFINERS.ALDRED & CO.,
WORKS: PARKER STREET, ASHLEY LANE,
MANCHESTER.

ESTABLISHED 1825.

EDWIN LEWIS AND SONS,

Patent Tube Works, MONMORE GREEN and Britannia Boiler Tube Works, ETTINGSHALL
WOLVERHAMPTON.

MANUFACTURERS OF

Lapwelded & Butt-welded Wrought-iron, Steel, or Homogeneous Tube
FOR EVERY

COLLIERY OR MINING PURPOSE.

J. WOOD ASTON AND CO., STOURBRIDGE

(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,

Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADE
FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS,
RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.Crab Winches, Pulley and Snatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions
WELDED STEEL CHAINS FOR CRANES, INCLINES, MINES, &c.,
MADE ALL SIZES.